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Improving Urban Pesticide Regulatory Activities to Protect Water Quality

Annual Update 2004

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PREFACE

This is a report of research performed by TDC Environmental, LLC for the San Francisco Estuary Project. This report was prepared for the San Francisco Estuary Project to fulfill the annual reporting requirement in Task 2.3.3 of its grant agreement with the State Water Resources Control Board (Agreement Number 04-076-552-0) for the Urban Pesticides Pollution Prevention Project (UP3 Project).

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1.0 INTRODUCTION

1.1 Background

As demonstrated by the U.S. Environmental Protection Agency's (U.S. EPA's) determination that registered pesticide use is a source of water quality impairment[1]—current U.S. EPA and California Environmental Protection Agency (Cal-EPA) procedures are insufficient to ensure that pesticide use does not cause violations of the Federal Clean Water Act and California Porter-Cologne Water Quality Control Act. Federal law provides U.S. EPA with the ability to protect surface water from pesticides. California law provides the California Department of Pesticide Regulation (DPR) with the ability to protect surface water from pesticides. The different procedures used by pesticide regulators (*i.e.*, the U.S. EPA Office of Pesticide Programs and DPR) and water quality regulators (*i.e.*, the U.S. EPA Office of Water and California State and Regional Water Quality Control Boards) to manage pesticides create a regulatory gap that leaves states and municipalities responsible for solving water quality problems that could have been prevented at the time a pesticide was registered or re-registered.

In California, three types of agencies address water quality problems:

- The *State and Regional Water Quality Control Boards* ("Water Boards") are responsible for maintaining water quality in California to protect designated uses of surface and ground waters. Among their important activities are solving water pollution problems ("impairments") with regulatory plans (Total Maximum Daily Loads or TMDLs) and issuing permits for surface water discharge (National Pollutant Discharge Elimination System or NPDES permits).

- *Municipal wastewater treatment plants* are also known as sewage treatment plants or publicly-owned treatment works (POTWs). These plants receive anything that is discharged into urban sewer systems. While they can regulate large industrial dischargers and a few commercial businesses, they cannot readily control most commercial and all residential discharges. They have NPDES permits with specific numeric limits based on water quality standards.

- *Urban runoff management agencies* oversee urban stormwater runoff drainage systems, which generally flow directly to surface waters without treatment. Under the Clean Water Act, municipalities in urban areas are issued permits for their discharges through storm drains, making them legally responsible for any water pollutants that wash off when it rains (or when irrigation, car washing, and other water flows into gutters and storm drains).

This report refers to all of the above agencies as "California water quality agencies."

Since late 1999, California water quality agencies have participated in selected U.S. EPA pesticide regulatory processes. Water quality agencies have also worked less formally with DPR. The goals of these activities are to:

- Prevent surface water impairment, and
- Avoid wastewater and stormwater NPDES permit violations

[1] Strauss, Alexis, Acting Director, Water Division, U.S. EPA Region 9, letter to the California State Water Resources Control Board modifying California's list of impaired water bodies (303[d] list), May 12, 1999. An impaired water body is one that does not meet water quality standards.

1.2 Scope of This Report

This is the second review of California water quality agencies' urban pesticide water quality regulatory activities. In April 2003, TDC Environmental reviewed and evaluated the outcomes of these efforts.[2] This report summarizes California water quality agency input into U.S. EPA urban water quality-related pesticide regulatory actions since late 1999 and evaluates the outcomes from that input, focusing on information received since the April 2003 review.

This report summarizes the activities of many organizations. Leaders include the San Francisco Bay Regional Water Quality Control Board, California Stormwater Quality Association (CASQA), Los Angeles County Sanitation Districts (LACSD), and the San Francisco Department of the Environment (SF Environment). Other key participants include members of the Urban Pesticides Committee and the technical advisory committee representing California municipal wastewater management agencies (Tri-TAC[3]).

1.3 Report Organization

This report is organized as follows:

- *Section 1* (this section) provides the background and scope of the report.
- *Section 2* describes the scope of California water quality agency regulatory activities.
- *Section 3* summarizes past and upcoming activities.
- *Section 4* evaluates the outcomes of activities to date, to the extent that outcomes are known at this time (most regulatory processes that California water quality agencies have participated in are still underway).
- *Section 5* reviews the progress made to date on the recommendations of the April 2003 evaluation.
- *Section 6* gives the conclusions of the evaluation and provides recommendations for future activities.
- *Appendix A* summarizes U.S. EPA activity for urban pesticides of interest to California water quality agencies.
- *Appendix B* provides an analysis of U.S. EPA's responses to comments by California water quality agencies (this includes only U.S. EPA responses received since the previous review was completed in April 2003).

[2] TDC Environmental, "Evaluation of Regional Efforts to Improve Existing Federal Regulatory Processes to Prevent Water Quality Impairment from Pesticides," memorandum from Kelly Moran to Bill Johnson, San Francisco Bay Regional Water Quality Control Board, April 23, 2003.

[3] Tri-TAC is a technical advisory committee on state and Federal regulatory issues affecting publicly owned treatment words that is jointly sponsored by the League of California Cities, the California Association of Sanitation Agencies, and the California Water Environment Association.

2.0 SCOPE OF CALIFORNIA WATER QUALITY AGENCY REGULATORY ACTIVITIES

2.1 U.S. EPA

California water quality agencies participate in U.S. EPA pesticide regulatory processes affecting urban surface water quality as follows:

- *Identify and track U.S. EPA regulatory processes with implications for urban surface water quality*. Keep an updated schedule of anticipated U.S. EPA public comment opportunities. Review Federal Register notices, risk assessments, and related documents and consult with water quality agencies and other experts to determine whether specific pesticides under U.S. EPA review have the potential to affect surface water quality or municipal wastewater or urban runoff NPDES permit compliance.
- *Identify specific information that would be valuable for California water quality agencies to share with U.S. EPA*. Identify specific shortcomings in U.S. EPA environmental risk assessments for urban pesticide uses that have the potential to adversely affect surface water quality or NPDES permit compliance. Obtain missing information that is available from California or from the literature (*e.g.*, water quality criteria, monitoring data, risk assessment methods, technical reports). Identify critical data gaps in the information available to assess the impacts of urban pesticide use.
- *Where potentially significant risks are evident, identify risk mitigation options*.
- *Communicate information to U.S. EPA*. Previous activities have determined that the primary mechanism for agencies to share relevant information with U.S. EPA is by writing letters. U.S. EPA's pesticide evaluation processes are set up to accept letters with technical information during public review periods. Less formal communications with U.S. EPA staff (telephone calls and meetings) also occur from time to time.
- *Review outcomes*. U.S. EPA responds to the information provided by California water quality agencies several ways: (1) by its actions in registration decisions and risk assessments, (2) in formal written responses prepared for some—but not all—actions, (3) informally in telephone conversations and e-mails.

Given the technical and regulatory complexity of these tasks, several California water quality agencies have provided funding to support a contractor (TDC Environmental) to conduct most of the above activities.

2.2 California Department of Pesticide Regulation

Primarily because DPR is a sister agency to the Water Boards within Cal-EPA, interaction with DPR has been direct and informal in nature. For example, water quality agencies have participated in various work groups with DPR, such as the Urban Pesticides Committee and the Copper Antifouling Paint work group.[4]

[4] Formally the Copper Antifouling Paint Sub-Workgroup of the Marina and Recreational Boating Workgroup of the Interagency Coordinating Committee (IACC). The IACC is a working group composed of 28 State agencies involved in implementing California's Nonpoint Source Pollution Control Program.

Water quality agencies track DPR's routine activities, which include two types of regulatory decisions relevant to urban surface water quality for which public comment opportunities are offered.

1. *Annual re-registration of all pesticides*. Each year, DPR renews the registration of the more than 11,000 pesticide products registered for use in the state. The process is basically a formality—public documents include only a short summary of the legal requirements for renewing registrations. Requests for pesticide re-evaluation are commonly made at this time, although such requests can be submitted at any time.
2. *Pesticide product registration*. Each week, DPR announces which pesticide products it is considering for registration. Most pesticide product registration requests are for products with pesticide active ingredients and uses that have previously been approved in California.

While these routine regulatory decisions offer formal opportunities for public comments on water quality related issues, on a practical basis, monitoring these processes is difficult because public documents do not contain DPR's assessment of the potential water quality impacts from each product. For this reason, water quality agency input has been limited.

2.3 Coordination Among Agencies

California water quality agency pesticide regulatory activities have been coordinated primarily through the Urban Pesticides Committee (UPC). Since the mid-1990s, the UPC has served as a center for information exchange, coordination, and collaboration among local, regional, and state agencies seeking to end pesticide-related surface water toxicity problems. Today, the UPC is a collaboration of more than 150 individuals representing water quality regulatory agencies, pesticide/water quality technical experts, municipal wastewater treatment plants, and stormwater management agencies. The UPC convenes bimonthly meetings (which can be accessed by teleconference) and has an e-mail list. This network, which was organized by the San Francisco Bay and Central Valley Regional Water Quality Control Boards, is currently being managed by the San Francisco Estuary Project as part of its Urban Pesticides Pollution Prevention Project.

3.0 SUMMARY OF PAST AND UPCOMING ACTIVITIES

3.1 U.S. EPA

Together, California water quality agencies have participated in U.S. EPA re-registration processes for the following 17 pesticides since 1999 (see Appendix A for details):

- Diazinon
- Chlorpyrifos
- Malathion
- Atrazine
- Carbaryl
- Zinc pyrithione
- Phenoxy herbicides (2,4-D, 2,4-DB, and MCPA)
- Arsenic and chromium-containing wood preservatives
- Creosote
- Lindane
- Metam sodium
- Miscellaneous antimicrobials (PHMB, Halohydantoins, Pine oil, Phenol)

California water quality agencies initially focused on diazinon, chlorpyrifos, and lindane, which were proven sources of urban surface water impairment and NPDES permit compliance problems. Once U.S. EPA announced the cancellation of most urban diazinon and chlorpyrifos uses, attention shifted to insecticide replacements that commonly occur in urban surface waters at levels that may cause adverse impacts to aquatic life (*e.g.*, carbaryl, malathion, and pyrethroids). Recognizing that the re-registration process offers a unique opportunity to prevent future water quality problems, agencies recently have begun to comment on pesticides for which there are little or no environmental data, but for which urban uses have the potential to cause exceedances of water quality criteria, aquatic toxicity, or violations of NPDES permits.

In addition, agencies have provided information to U.S. EPA regarding eight other decisions (see Appendix A for details):

- Organophosphorous pesticide cumulative risk assessment
- U.S. EPA Office of Pesticide Programs Strategic Plan
- Methodology for lower toxicity pesticide chemical risk assessments
- Endangered species (West Coast salmon) consent decree
- Proposed rule: Endangered species act consultations on pesticide registrations
- U.S. EPA guidance on applications of pesticides to surface waters
- Pesticide registration improvement act
- Proposed rule: Standards for pesticide containers and containment

Most of these comments were made in response to opportunities for input into U.S. EPA risk assessment and data collection methods, priorities for pesticide regulation, or management of pesticides for water quality protection.

3.2 California Department of Pesticide Regulation

While most California water quality agency interaction with DPR has been informal and collaborative in nature, several specific requests have been made for DPR action:

- *Re-evaluation request*. The California State Stormwater Quality Task Force (the predecessor of CASQA) requested that DPR re-evaluate urban uses of diazinon and chlorpyrifos.
- *Registration request*. Tri-TAC asked DPR to register pesticide-impregnated clothing.
- *Registration water quality assessments*. Water quality agencies asked DPR staff to conduct analyses of water quality impacts of several pesticide products being evaluated for registration. These products and uses include copper-containing roofing material, permethrin use in floor drains, and pyrethrins use in storm drains.

3.3 Schedule

3.3.1 U.S. EPA

A schedule of anticipated upcoming U.S. EPA pesticide re-registration activities relevant to urban water quality is in Appendix A. U.S. EPA will be reviewing the registrations of most common diazinon and chlorpyrifos replacement products by August 2006. These re-registrations are critically important to water quality because insecticides entering the market to replace urban uses of diazinon and chlorpyrifos may cause surface water toxicity.[5] For most pesticides, this will be the first review since the pesticide was originally registered, which may have been decades ago. The urban use pesticides that have been linked to potential water quality problems with anticipated public input opportunities in 2005 are permethrin, malathion, copper sulfate, and other copper compounds.

In addition to the re-registration actions on the schedule, U.S. EPA is developing regulations for future rounds of pesticide re-registrations, which are intended to occur at 15-year intervals. U.S. EPA plans to develop these regulations over the next two or three years. California water quality agencies intend to participate in the development of these regulations.

3.3.2 California Department of Pesticide Regulation

DPR's routine activities include:

- Once a year (usually in November or December), the annual renewal of all pesticide product registrations.
- Each week, announcements of pesticide products entering evaluation.

No other urban water quality-related regulatory actions are known to be planned for the coming year.

Under a Management Agency Agreement between DPR and the State Water Resources Control Board, DPR and the State Water Board intend to hold public meetings to discuss pesticide water quality regulatory issues, including urban issues. While no such meetings have been held to date, the two agencies have discussed convening a public meeting in 2005.

[5] TDC Environmental, *Insecticide Market Trends and Water Quality Implications*, report prepared for the San Francisco Estuary Project and the San Francisco Bay RWQCB, April 2003.

4.0 EVALUATION OF OUTCOMES

Staff comments, agency actions, and U.S. EPA written materials show that the efforts of California water quality agencies have begun to change the way U.S. EPA and DPR conduct pesticide regulatory activities. This evaluation of the outcomes of the California water quality agencies' efforts to improve pesticide regulatory processes involved review of U.S. EPA documents, analysis of written responses to California Water Quality Agency comments, decisions made by U.S. EPA and DPR relating to urban pesticides and surface water quality, and interviews with U.S. EPA and DPR staff.

The ability to evaluate outcomes is limited at this time, because California water quality agencies have only participated in a few fully completed pesticide re-registration processes. The outcomes of these processes are affected by many scientific and political factors unrelated to water quality. Since U.S. EPA spends several years preparing each risk assessment and procedures are complex, changes occur very slowly. U.S. EPA has not yet responded to most of the comments sent by water quality agencies because the next steps in those regulatory processes are still underway.

In 2004, U.S. EPA released responses to three sets of California water quality agency comments—for carbaryl,[6] diazinon,[7] and MCPA.[8] A 2004 *Federal Register* notice relating to Endangered Species Act implementation procedures included Federal responses to comments relating to U.S. EPA pesticide risk assessment procedures.[9] Appendix B contains analyses of these responses.

In general, U.S. EPA and DPR staff believe that California water quality agency efforts are effective. Staff from U.S. EPA Office of Pesticide Programs, Office of Water, and Region 9 stated that they believe that the written comments sent to U.S. EPA are valuable and recommend that water quality agencies continue to communicate information and recommendations to U.S. EPA.

4.1 U.S. EPA

4.1.1 U.S. EPA Pesticides Staff Are Becoming Aware of Urban Pesticides Water Quality Issues

U.S. EPA Office of Pesticide Program staff are generally more willing to consider and address water quality issues than they have been in years past. In recent written responses, the Office of Pesticides Programs has changed its tone significantly. While past responses rejected water quality information (even U.S. EPA's own adopted water quality criteria), recent responses have changed in both tone and content, indicating that water quality-related comments are being treated seriously and thoughtfully.

U.S. EPA Region 9 has become proactive in its efforts to support activities to prevent and respond to pesticide-related water quality problems. Region 9 actions include:

- *Enhanced coordination between its Water Division and Pesticides Section*.

[6] U.S. EPA, Office of Pesticide Programs, "Response to Phase 5 Comments on the Interim Reregistration Eligibility Decision (IRED) Document for Carbaryl," Memorandum from R. David Jones and Thomas Steeger, Environmental Fate and Effects Division, to Anthony Britten and Michael Goodis, Special Review and Reregistration Division, July 14, 2003.
[7] U.S. EPA, Office of Pesticide Programs, "Response Public Comments on the Diazinon IRED," Memorandum from Debra Edwards, Special Review and Reregistration Division, to Diazinon EDOCKET OPP-2002-0251, June 23, 2004.
[8] U.S. EPA, Office of Pesticide Programs, *Reregistration Eligibility Decision for MCPA*, September 30, 2004.
[9] "Joint Counterpart Endangered Species Act Section 7 Consultation Regulations," *Federal Register*, Vol. 69, No. 150, p. 47731-47762, August 5, 2004.

- *Assignment of a Pesticides Section staff member to act as a regional liaison for water quality agencies*.
- *Working to make water agencies partners in the pesticide regulatory process*.

The latter effort could create important opportunities in the future. For years, state pesticide and agriculture agencies have been viewed as regulatory partners by U.S. EPA Office of Pesticide Programs. Region 9 staff are seeking to get the Office of Pesticide Programs to treat water quality agencies as another equally important set of regulatory partners.

4.1.2 U.S. EPA Has Changed Environmental Risk Assessment Procedures

California water quality agency comments about U.S. EPA's environmental risk assessment procedures for pesticides have changed the way U.S. EPA conducts its risk assessments. While more changes are needed, the changes made to date will significantly improve risk assessment quality.

The most important set of changes in U.S. EPA environmental risk assessment procedures apparently came about in response to comments that were not made directly to U.S. EPA. The San Francisco Bay Regional Water Quality Control Board sent comments to the U.S. Fish & Wildlife Service and the National Oceanic and Atmospheric Administration (NOAA) Fisheries in regard to a rulemaking on procedures for protecting endangered species from pesticides. The proposed procedures (which have since been enacted in regulation) entailed making a finding that U.S. EPA pesticide environmental risk assessment procedures provide adequate methods to identify and mitigate risks to aquatic endangered species. The Water Board's comments focused on the shortcomings of the U.S. EPA pesticide risk assessment process in regard to protection of aquatic species. The pesticide risk assessment procedure changes are summarized below:

- *U.S. EPA will use all available scientific data, whether from manufacturers or the published literature*. For example they will use all aquatic toxicity data available, including data from ECOTOX, EPA's agency-wide environmental toxicity database (which includes the water-specific database ACQUIRE). Previously U.S. EPA only allowed data from pesticide manufacturers to be used as the primary data source for pesticide risk assessments.
- *U.S. EPA will assess the environmental risks from pesticide inert ingredients and will look at how formulations affect risk*. This commitment responds to California findings that inert ingredients and formulations can increase water quality impacts from pesticides.[10] Unfortunately, analyses will only be conducted to the extent that data to support such analyses already exist—U.S. EPA will not require data necessary for such analyses from pesticide manufacturers.
- *U.S. EPA will assess the environmental risks from pesticide degradates*. While such analyses will be conducted to the extent that data are available, U.S. EPA says that in the absence of other data, it will assume that degradates are as toxic as the parent compound.

[10] TDC Environmental, *Diazinon & Chlorpyrifos Products: Screening for Water Quality Implications*, prepared for the San Francisco Estuary Project, May 15, 2001.

- *U.S. EPA will consider cumulative effects of pesticides*. It will do so only to the extent that data are available in the literature.[11]
- *U.S. EPA will identify uncertainty in its environmental risk assessment*. It will include a section in each environmental risk assessment describing the uncertainties inherent in the analysis.

Comment letters on pesticide risk assessments apparently triggered two other important changes in U.S. EPA environmental risk assessment procedures:

- *U.S. EPA routinely uses available monitoring data for urban surface waters in its environmental risk assessments for pesticides with urban uses*. U.S. EPA environmental risk assessments now include available surface water monitoring data from the U.S. Geological Survey National Water Quality Assessment (NAWQA) and the Office of Water's STORET database. They also describe any data submitted by commenters. This change appears to have been made in response to California water quality agency comments. Since urban pesticide uses are not modeled for aquatic risk assessments, U.S. EPA uses available monitoring data to estimate surface water concentrations. Since monitoring is usually not timed to obtain maximum pesticide concentrations and often does not include pesticides of interest (*e.g.*, pyrethroids, PHMB), this method likely understates risks, but is an improvement to the previous procedures, which did not involve consideration of urban uses.
- *U.S. EPA has assessed environmental risks from sewer discharge of a pesticide*. In the lindane re-registration documents, U.S. EPA Office of Pesticide Programs conducted its first ever sewage discharge analysis for a pesticide. This analysis was conducted in response to California water quality agency comments. It is unclear if U.S. EPA will make the lindane analysis a precedent, as no subsequent environmental risk assessment has evaluated pesticide sewer discharges.

4.1.3 U.S. EPA Has Ended or Changed Some Urban Pesticide Uses of Concern for Water Quality

U.S. EPA has completed only a few of the pesticide re-registration processes that California water quality agencies have participated in. Therefore, this evaluation of the changes in pesticide use is necessarily incomplete. Nevertheless, U.S. EPA's re-registration process has made several significant changes related to urban pesticides of concern for surface water quality. California water quality agency comments probably contributed to U.S. EPA's motivation for making these changes. The extent that water quality agency comments contributed to U.S. EPA's decision generally cannot be determined specifically; however, in a few cases, U.S. EPA made specific changes in response to California water quality agency comments—these cases are identified below.

- *Chlorpyrifos*. Most urban uses were terminated, but some potentially problematic uses continue (*e.g.*, golf courses). Applications in storm drain manholes were specifically prohibited in response to California water quality agencies' requests.
- *Diazinon*. All urban uses were terminated (but cut flower and nursery uses could occur in urban areas). Use of diazinon trunk wraps in urban areas was specifically prohibited in response to California water quality agencies' requests.

[11] In the MCPA RED U.S. EPA says that it does not have methods to assess cumulative environmental risks from pesticides, making it unclear how this commitment will be met.

- *Lindane*. U.S. EPA modified the national lindane water quality criteria and asked FDA to enact measures to reduce use of lindane pharmaceuticals (which are not regulated by U.S. EPA).
- *Atrazine*. The allowable application rate for urban lawn use was reduced.
- *Carbaryl (decision not final)*. Pet care applications were terminated, apparently partly in response to California water quality agency questions about this use, which involved discharges to municipal wastewater treatment plants. Residential lawn applications were temporarily limited on the basis of human health concerns, but may be reauthorized when a planned human health risk re-analysis is completed.

Appendix A contains a more detailed summary of the most common urban uses of each pesticide, the urban use changes made in the re-registration process and the likely relevance of water quality agency comments in these changes.

4.1.4 U.S. EPA Has Attempted to Improve Cooperation Between U.S. EPA Offices

In response to water quality agencies' requests for cooperation between the U.S. EPA's Office of Pesticide Programs and Office of Water, U.S. EPA began several different initiatives to address pesticides and water quality. For example, U.S. EPA made commitments to determine how pesticide risk assessments impact U.S. EPA responsibilities under the Clean Water Act and to develop water quality criteria in parallel with certain pesticide re-registration reviews. Only one significant written product has been generated from these activities—the Atrazine Registration Eligibility Decision included an appendix listing differences between U.S. EPA Office of Water and Office of Pesticide Programs risk assessment methods. No changes in environmental risk assessment procedures or regulatory actions are known to have occurred as a result of past interoffice initiatives.

Current U.S. EPA activities to promote cooperation are more promising. In 2004, U.S. EPA Region 9's pesticide and water quality teams worked together to promote a new approach to inter-office cooperation. The Region was able to initiate EPA headquarters meetings between the Office of Water and the Office of Pesticide Programs on pesticide and water quality issues. This is a new approach to cooperation, involving staff-to-staff interactions, rather than a senior management initiative. U.S. EPA Region 9 staff are optimistic that these direct staff-to-staff meetings will have a meaningful effect on the pesticides registration process because they will educate Office of Pesticide Programs' technical staff about water quality and the Clean Water Act.

4.1.5 U.S. EPA Responses Have Clarified Some Barriers to Addressing Urban Pesticide Water Quality Issues

In its recent responses to comments, U.S. EPA has identified the following barriers to addressing urban pesticide surface water quality issues raised by California water quality agencies:

- *U.S. EPA Office of Pesticide Programs believes that modeling surface water concentrations due to urban pesticide use is not currently feasible*. U.S. EPA pesticide risk assessments need to estimate upper-bound surface water concentrations of pesticides. The Office of Pesticide Programs believes that urban runoff models are at a "developmental stage." Identification of "high exposures" watersheds is needed. For those identified watersheds, monitoring data for calibration purposes is needed. While the Office of Pesticide Programs has committed to "stay abreast of model developments," it does not appear to

believe that developing models itself (which it did for agricultural pesticide uses) is necessary.

- *U.S. EPA Office of Pesticide Programs believes that urban pesticide use data is not available*. The Office of Pesticide Programs believes that there is rarely "accurate and complete" information on the amounts of pesticides used in urban areas. This has led it to conclude that data of sufficient quality to support urban runoff and wastewater modeling is not available.
- *U.S. EPA Office of Pesticide Programs does not have information on what managing pesticide-related water quality issues costs water quality agencies*. The Office of Pesticide Programs says that it historically has not assessed the economic impacts from risks to aquatic organisms because the agency does not have a reliable source of information as to what the costs of water quality management are.
- *U.S. EPA Office of Pesticide Programs does not have a method to estimate pesticide use changes due to phase out of another pesticide*. The Office of Pesticide Programs believes that such changes are unknown and cannot be estimated.
- *Pesticide monitoring in surface water and wastewater should be done by others*. The typical response to requests for better estimates of environmental concentrations of pesticides is a request to obtain and send monitoring data to U.S. EPA.
- *U.S. EPA Office of Pesticide Programs considers significant aquatic invertebrate risks to be unimportant*. The Office of Pesticide Programs routinely dismisses significant aquatic invertebrate risks. It is apparently unaware that the risks to aquatic invertebrates may be the basis for water quality criteria, water quality regulatory programs, and enforceable requirements in NPDES permits.
- *U.S. EPA Office of Pesticide Programs does not have a method to conduct cumulative environmental risk assessments for pesticides*. The Office of Pesticide Programs feels that the best available science lacks the supporting toxicity data and exposure tools that would be required to conduct cumulative assessments for pesticides in the ambient environment.
- *U.S. EPA Office of Pesticide Programs confuses drinking water quality and generic surface water quality issues*. The Office of Pesticide Programs often confuses "water quality" with "drinking water quality," responding to environmental risk related comments only in the narrow context of drinking water.
- *U.S. EPA Office of Pesticide Programs often considers only the agricultural context of its actions*. Although U.S. EPA estimates that 24% of the nation's pesticide use occurs in urban areas and California data suggest that more than 50% of pesticide use is urban,[12] pesticide regulatory programs have always focused on agricultural uses. The Office of Pesticide Programs often responds to comments about urban pesticide uses with responses that are specific to agricultural uses.

[12] Kiely, T., Donaldson, D., Grube, A., U.S. EPA Office of Pesticide Programs, *Pesticides Industry Sales and Usage 2000 and 2001 Market Estimates*, May 2004. These data are not consistent with California DPR pesticide sales and use reporting data (available on the Internet, http://www.cdpr.ca.gov/dprdatabase.htm), which show that less than one-third of pesticides sold between 1998 and 2002 were used for reportable uses (all agricultural uses and certain urban applications by pest control professionals), suggesting that up to two-thirds of pesticides are used in urban areas.

The clarification of these barriers is helpful in that it provides focus for future efforts to assist U.S. EPA with obtaining the needed information—or to persuade the agency that an alternative approach is feasible.

There are several important questions that California water quality agencies would like U.S. EPA Office of Pesticide Programs to clarify:

- Why it does not use water quality criteria methodology (or actual criteria, when available) to determine surface water concentrations used to assess risks to aquatic life.
- Why it does not do benefits analyses for urban pesticide uses, even though it does such analyses for agricultural pesticide uses.
- Why it includes harmful pesticide alternatives among its recommendations when less toxic alternatives exist.

4.2 California Department of Pesticide Regulation

Because DPR has not been a focus of water quality agency activities, fewer actions of note were identified in the review. These are summarized below.

4.2.1 DPR Can Improve the Use of its Regulatory Authority to Address Urban Water Quality Issues

DPR's regulatory programs have not yet been integrated into the developing cooperative relationship between DPR and California water quality agencies.

- *DPR has promised to consider urban water quality in pesticide product registrations*. This commitment is a positive outcome from several informal requests for DPR to consider water quality in the registration evaluation of several urban pesticides. DPR intends to begin scanning pesticides entering registration to determine which ones may need a review for urban water quality impacts. The first action planned under this process will be a review of the potential water quality and wastewater compliance impacts from a permethrin product that is proposed to be applied in floor drains.
- *DPR declined to re-evaluate urban uses of diazinon and chlorpyrifos*. California water quality agencies formally requested that DPR re-evaluate urban uses of diazinon and chlorpyrifos. While DPR initially denied all requests to put diazinon and chlorpyrifos into re-evaluation, it did eventually initiate re-evaluation of certain agricultural uses. Although no written rationale was provided for omitting uses that occur in urban areas (*e.g.*, nurseries, cut flowers, golf courses) from re-evaluation, staff informally cited the lack of evidence of water quality problems directly associated with remaining urban uses.
- *DPR declined to register permethrin-impregnated clothing*. Tri-TAC requested that DPR review permethrin-impregnated clothing for registration and consider the impacts of sewer discharge of the permethrin. DPR declined to use its authorities, explaining that it has previously registered lower concentration permethrin-containing products for clothing treatment and it has not received complaints or monitoring data indicating a water quality problem from these products. DPR also noted that it does not register clothing products (though U.S. EPA did register the product in question).

4.2.2 DPR is Cooperating with California Water Quality Agencies

In the last few years, DPR has improved communication and cooperation with California water quality agencies in regard to urban pesticide issues.

- *DPR Environmental Monitoring Branch staff has become aware of urban pesticide water quality issues*. DPR has assigned a staff member to work on urban pesticide water quality problems.
- *DPR works cooperatively with State and Regional Water Boards*. The State Water Board-DPR Management Agency Agreement outlines formal routes of communication. In reality, this coordination primarily involves staff-to-staff communication on specific pesticide issues. DPR's staff level coordination with water quality agencies has improved over the last several years, thanks in part to direct engagement of DPR staff in Water Board processes to develop TMDLs for urban surface waters.

The improving staff level cooperation provides reason for optimism that meaningful changes in regulatory processes are possible, even though few such changes have occurred to date for urban pesticides.

4.2.3 DPR Budget Cuts Have Significantly Reduced Urban Surface Water Program Support

Most of DPR's programs that supported California water quality agency pesticide activities were cut in response to recent DPR budget problems. Over the last few years:

- *DPR eliminated its contracts for water quality investigations*. DPR still issues a few small contracts and conducts a few investigations of its own.
- *DPR reduced its water quality monitoring activities*. In house staff conduct a few investigations a year, primarily in agricultural areas.
- *DPR terminated its pest management alliance grant programs*. These grant programs were DPR's primary method of developing and promoting less toxic pest control methods. DPR currently relies on the University of California Statewide Integrated Pest Management Program to support to the state's pest control community.
- *DPR reduced its already small integrated pest management program*. Remaining elements for urban areas are the IPM Innovator awards and the schools IPM program (a response to state legislation—the California Healthy Schools Act of 2000).

These programs may have been selected for reduction because they involved contracts and grants, which could be cut without eliminating staff positions. Unfortunately, eliminating these programs leaves California water quality agencies without some previously valuable assistance for efforts to address urban pesticide-related water quality problems, and DPR without the resources to obtain the types of information it has historically required to make regulatory decisions about water quality.

5.0 PROGRESS ON PREVIOUS RECOMMENDATIONS

The April 2003 review and evaluation of California water quality agency participation in pesticide regulatory activities included several recommendations, all of which generated follow-up actions. Below is a progress report on each recommendation.

Previous Recommendation 1: Continue to provide U.S. EPA with information to prevent potential water quality problems associated with urban pesticide use.

> *Action to date*: California water quality agencies have continued to provide information to U.S. EPA. Participation has been limited in time periods when there was no or limited funding for technical support for the program.

Previous Recommendation 2: Facilitate involvement of other California water quality agencies in Federal urban pesticide regulatory processes that may affect water quality.

> *Action to date*: The network of California water quality agencies that regularly provide information to U.S. EPA is stronger. In addition to the previous leaders (the Water Boards and CASQA), San Francisco's Department of the Environment and wastewater agencies (Los Angeles County Sanitation Districts and Tri-TAC) have begun to provide input to U.S. EPA on a regular basis. Opportunities exist to improve teamwork among California water quality agencies, to streamline comment preparation processes within individual organizations, and to increase involvement among individual storm water programs, sewer agencies, and municipalities. Further strengthening of the network's breadth and organization will make water quality agency comments more efficient and effective.

Previous Recommendation 3: Consider participating in public forums (such as national advisory committees and national conferences) to enhance nationwide understanding of managing urban pesticides to prevent surface water quality programs.

> *Action to date*: Action on this recommendation has been limited, but successful. For example, a presentation by a Los Angeles County Sanitation Districts staff member at a national Association of Metropolitan Sewerage Agencies (AMSA) conference generated a flurry of activity by AMSA leaders, U.S. EPA Office of Water managers, and the press. California's ongoing budget problems have temporarily limited out of state travel, making participation in national forums impossible for most state and municipal staff at the present time.

Previous Recommendation 4: Identify practical methods to address the environmental effects of all ingredients in individual pesticide products as those products are registered.

> *Action to date*: In its responses to California water quality agency comments, U.S. EPA has indicated that it agrees that such tools need to be developed, particularly methods to model runoff of pesticides from urban areas (see Section 4). Facilitating the process of finding ways to fill these methodology gaps needs to be a priority for California water quality agencies.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

Conclusion 1: The most cost-effective approach to protecting surface water from pesticide-related toxicity is to prevent pesticide uses that have significant potential to cause water quality impairment. The most significant opportunity to prevent problem pesticide uses is the U.S. EPA pesticide re-registration process; it is the only ongoing process that combines an evaluation of the water quality impacts of pesticides with the regulatory authority to terminate any use that causes significant impacts.

Conclusion 2: DPR's authorities to protect surface water quality from pesticides have not yet been used to implement significant actions to protect urban water quality. While California water quality agencies have developed a cooperative relationship with DPR, they have not succeeded in getting DPR to use its regulatory authority to prevent urban surface water impacts and NPDES permit compliance problems from urban pesticide use. Water quality agencies need to learn more about how to work with DPR's regulatory processes in order to structure their engagement with DPR in a manner that will lead to needed regulatory actions.

Conclusion 3: Information from California water quality agencies appears to have encouraged U.S. EPA to make changes to its pesticide environmental risk assessment procedures that improve the quality of assessment of surface water quality impacts. While U.S. EPA has significantly improved its environmental risk assessment procedures, more changes in U.S. EPA's pesticide registration and re-registration processes are needed to ensure consistency with Clean Water Act requirements for water quality protection and to prevent pesticide-related violations of NPDES permits. Without continued pressure from entities like California water quality agencies, U.S. EPA appears unlikely to make meaningful changes to address these problems.

Conclusion 4: To date, the California water quality agencies' record on achieving changes in pesticide use is mixed. Water quality was a factor—but perhaps not a major factor—in U.S. EPA decisions to ask manufacturers to phase out many urban uses of pesticides of concern for water quality. Some types of requests (*e.g.*, specific requests for label language changes) have proven more successful than others (*e.g.*, requests to consider terminating uses that were not evaluated in ecological risk assessments). The reasons for this mixed record include the low priority that U.S. EPA's Office of Pesticide programs appears to afford to water quality (other than drinking water), the lack of information about pesticide toxicity to aquatic species, politics specific to particular pesticides (*e.g.*, atrazine), and the use of risk assessment methodologies that miss or understate impacts from urban pesticide use.

Conclusion 5: Comments on actions important to U.S. EPA—rather than those most important to California water quality agencies—have proven effective in achieving changes. For example, while most water quality agencies declined to comment on a highly controversial Federal Endangered Species Act rulemaking, the climate of controversy proved favorable for significant changes to U.S. EPA Office of Pesticide Program's environmental risk assessment methodologies.

6.2 Recommendations

Recommendation 1: Continue to provide U.S. EPA and DPR with information to prevent potential water quality problems associated with urban pesticide use.

Recommendation 2: Continue to press for consistency in implementation of water quality and pesticide regulatory programs within U.S. EPA and California EPA.

Recommendation 3: Strengthen the network of California water quality agencies working on urban pesticides issues. Improving teamwork among California water quality agencies will ensure that water quality agency leaders have ready access to information, that agency comments are consistent, and that agencies do not duplicate efforts. Further strengthening of the network's breadth by increasing involvement among individual storm water programs, sewer agencies, and municipalities will elevate the importance of these issues for U.S. EPA.

Recommendation 4: Work with statewide and national organizations (*e.g.*, CASQA, Tri-TAC, AMSA) to streamline comment preparation processes. Clarification of urban pesticide water quality issues, organizational positions, types of information available from organization members, and processes for preparing comments will minimize the effort required for organizations to provide useful information and effective comments to U.S. EPA and California DPR.

Recommendation 5: Develop a stable funding mechanism to continue technical support for California water quality agency participation in U.S. EPA and California DPR regulatory activities affecting water quality.

Recommendation 6: Water quality agency staff should consider participating in public forums (such as national advisory committees and national conferences) to enhance nationwide understanding of managing urban pesticides to prevent surface water quality programs. While budgets may limit travel, opportunities may exist for scholarships, U.S. EPA-funded travel, attending meetings in California, or participation by teleconference.

Recommendation 7: Determine possible approaches and next steps toward developing practical methods for U.S. EPA and DPR to address the environmental effects of all ingredients in individual pesticide products when those products are registered or re-registered. Initial steps include identifying available modeling tools and modeling information resources, determining what entities (*e.g.*, U.S. EPA, university, private) have appropriate expertise to address methodology gaps, and scoping out the work required to address the most critical methodology and information gaps.

Recommendation 8: Strengthen relationships with California DPR's regulatory programs. Currently, California water quality agencies do not have a practical understanding of specifically how DPR's regulatory authorities can be exercised to protect urban water quality. For example, agencies should work with DPR to learn how DPR assesses water quality impacts of urban pesticide uses and what types of water quality-related analyses may be available for public review. Water quality agencies need to explore how registration, re-evaluation, and other authorities work.

APPENDIX A. U.S. EPA PESTICIDE REGULATORY ACTIVITY

Information in this appendix:

1. U.S. EPA Pesticide Re-Registration Comment Letters by California Water Quality Agencies
2. U.S. EPA Pesticide Regulatory Activity Comment Letters by California Water Quality Agencies
3. U.S. EPA Pesticide Re-Registration Schedule
4. Changes in Pesticide Uses of Urban Water Quality Concern, 1999-2004

U.S. EPA Pesticide Re-Registration Comment Letters by California Water Quality Agencies

Activities of Urban Surface Water Quality Interest

Pesticide	Preliminary Risk Assessment	Revised Risk Assessment	Registration Eligibility Decision*	Notes
Organophosphates				
Diazinon	SWQTF, ACCWP, CCCSD	SWQTF, SFBRWQCB, CVRWQCB, SWRCB, SFEI	SFBRWQCB, BASMAA, CCSF	IRED revised 5/04, but no public comment period has been noticed
Chlorpyrifos	SWQTF, CCSF, SFBRWQCB, CCCSD	SWQTF	SWQTF, SFBRWQCB	IRED process completed. Also commented on FR Notice changing manufacturer agreement: SWQTF, SFBRWQCB, Tri-TAC
Malathion	--	SFBRWQCB, SWQTF		Re-revised risk assessment to be issued
Misc. Insecticides				
Atrazine	--	SFBRWQCB	SFBRWQCB	Revised IRED and water quality criteria: SFBRWQCB, CASQA, LACSD, AMSA (Still need to watch for R to C--none 11/04)
Carbaryl	SWQTF, SFBRWQCB	CASQA, SFBRWQCB, LACSD	Currently out for review	
Zinc Pyrithione	SFBRWQCB	EPA to skip		
Phenoxy herbicides				
2,4-D	SFBRWQCB, CCSF			
2,4-DB	SFBRWQCB			
MCPA	SFBRWQCB	EPA to skip		RED issued, but not yet circulated for public review
Wood Preservatives				
As/Cr Compounds	SFBRWQCB, CCSF			
Creosote	SFBRWQCB, CCSF, Tri-TAC			
Antimicrobials				
Lindane	LACSD	SFBRWQCB, LACSD	SFBRWQCB, LACSD	RED complete (Still need to watch for R to C--none 11/04)
Halohydantoins	SFBRWQCB, LACSD	EPA to skip		
Metam Sodium	SFBRWQCB, CASQA, LACSD	SFBRWQCB, CASQA, LACSD		
PHMB	SFBRWQCB, CASQA, LACSD	EPA to skip		
Pine Oil	SFBRWQCB, LACSD	EPA to skip		
Phenol	SFBRWQCB, LACSD	EPA to skip		

U.S. EPA Pesticide Regulatory Activity Comment Letters by California Water Quality Agencies
Activities of Urban Surface Water Quality Interest

Pesticide Regulatory Activity	Who Commented
Cumulative risk assessment for organophosphorous pesticides	SWQTF
OPP Strategic Plan, 2002	SFBRWQCB
Methodology for lower toxicity chemicals (risk assessments)	SFBRWQCB
Endangered species consent decree	SFBRWQCB
ANPRM: Endangered species act consultations	SFBRWQCB
Proposed rule: Endangered species act consultations	SFBRWQCB
Interim statement & guidance: application of pesticides to waters of the U.S.	SFBRWQCB, SWRCB, CASQA
S. 1664, Pesticide registration improvement act of 2003	CASQA
Proposed rule: Standards for pesticide containers & containment	LACSD
Globally Harmonized System for Pesticide Hazard Classification and Labeling	CCSF

U.S. EPA Pesticide Re-Registration Schedule

Pesticides of Urban Surface Water Quality Interest

Pesticide	Preliminary Risk Assessment	Revised Risk Assessment	Registration Eligibility Decision*	Notes
Atrazine				EPA attempted to integrate water & pesticide regulatory actions
Carbaryl				IRED in public review period (12/04)
Copper				
Copper compounds			Planned by 5/06	
Copper sulfate			Planned by 5/06	
Copper oxides			Planned by 8/06	
Copper salts			Planned by 6/07	
Dicamba			Planned by 5/06	
p-Dichlorobenzene			Planned for 3/08	Possibly important for POTWs
Lindane				
Organophosphates				
Diazinon				IRED revisions have occurred; not circulated for public comment
Chlorpyrifos				
Malathion			Planned by 9/05	Re-revised risk assessment to be issued
MGK-264	4/05		Planned by 6/06	Synergist for pyrethrins & pyrethroids
Metam Sodium			Planned by 9/05	Comment periods planned in early and late 2005
Phenoxy herbicides				
2,4-D		12/04	Planned by 5/05	
2,4-DB		Plan to skip	Planned by 1/05	
2,4-DP			Planned by 9/07	
MCPA		Plan to skip	Planned by 9/04	RED signed, but not yet released for public comment
MCPP			Planned by 9/07	
Piperonyl Butoxide	4/05		Planned by 6/06	Synergist for pyrethrins & pyrethroids
Pyrethrins	4/05		Planned by 6/06	
*Pyrethroids***				
Allethrins			Planned by 3/07	
Cypermethrin			Planned by 5/06	
Permethrin	4/05		Planned by 6/06	
Resmethrin			Planned by 5/06	
Sumithrin			Planned for 9/08	
Tetramethrin			Planned for 9/08	
Tributyltin			Planned by 9/07	Includes related compounds
Wood Preservatives				
As/Cr Compounds			Planned by 9/05	Arsenic and chromium-containing wood preservatives like CCA
Creosote			Planned by 9/05	
Pentachlorophenol	planned 9/04		Planned by 9/05	New schedule unknown
Zinc Pyrithione		Plan to skip	Planned by 9/04	Marine antifouling paint use of particular interest
Antimicrobials				
PHMB		Plan to skip	Planned by 9/04	Anticipate release in 1/05
Pine Oil		Plan to skip	Planned by 9/04	Anticipate release in 1/05
Phenol		Plan to skip	Planned by 9/04	Anticipate release in 1/05
Halohydantoins		Plan to skip	Planned by 9/04	Anticipate release in 1/05

Other Priority items:

U.S. EPA Pesticide re-registration rulemaking to define procedures for future 15-year reviews (draft regulations planned for Fall 2004)
Comparative Assessment for synthetic pyrethroids (was expected 4/04)
Of potential agricultural interest: PCNB (Pentachloronitrobenzene; risk assessment 1/05)
Of potential urban interest: Endothall (risk assessment 1/05)

*For those that are part of a cumulative group, this is an Interim Registration Eligibility Decision that will be finalized later
**Scheduled for tolerance review only (no environmental risk assessment): bifenthrin, cyfluthrin, esfenvalerate, imidacloprid, lambda-cyhalothrin

Updated 11/23/2004

Changes in Pesticide Uses of Urban Water Quality Concern, 1999-2004
(Listed in Chronological Order)

Pesticide	Most Common Urban Uses	Urban Use Changes	Comments
Chlorpyrifos	Lawn, garden, around buildings, manholes	Most urban uses terminated, but some potentially problematic remain. Applications in storm drain manholes was prohibited	Water quality was probably not a factor in U.S. EPA's decision.
Diazinon	Lawn, garden, around buildings	All urban uses terminated. Cut flower and nursery uses could occur in urban areas.	Water quality was probably a minor factor in U.S. EPA's decision. As requested, U.S. EPA added label language to clarify that diazinon trunk wraps should not be used in urban areas. Requested evaluations of nurseries and cut flowers uses were rejected.
Lindane	Lice and scabies treatments	EPA asked FDA to enact measures to reduce use and modified national lindane water quality criteria.	Water quality agency actions likely a factor in the decision to address pharmaceuticals that are not regulated by U.S. EPA and the decision to modify the lindane water quality criteria.
Atrazine	Lawn	Reduced application rate	Comments were related to approach to decision, not to specific uses
Carbaryl (decision not final)	Lawn, garden, pets	Pet applications terminated. Residential lawn applications temporarily limited, but may be reauthorized.	Water quality likely a factor in pet care use termination, but does not seem to be a factor in the ongoing evaluation of lawn uses.
MCPA	Lawns and rights of way	Application rates will be reduced.	Comments were not directly related to this change.

Source: TDC Environmental evaluation of U.S. EPA Reregistration Eligibility Decisions.

APPENDIX B. ANALYSIS OF U.S. EPA RESPONSES TO CALIFORNIA WATER QUALITY AGENCIES

Information in this appendix:

1. Carbaryl Revised Risk Assessment Comment Analysis—Comments from California Water Quality Agencies
2. Diazinon IRED Comment Analysis—Comments from California Water Quality Agencies
3. MCPA RED Comment Analysis—Comments from California Water Quality Agencies
4. Comment Analysis—Joint Counterpart Endangered Species Act Section 7 Consultation Regulations, Federal Register: August 5, 2004 (Volume 69, Number 150), Pages 47731-47762, 50 CFR Part 402

Carbaryl Revised Risk Assessment Comment Analysis
Comments from California Water Quality Agencies

Comment	U.S. EPA Response	Notes
Risk Assessment		
Carbaryl commonly detected in urban surface waters at concentrations known to cause adverse effects. Monitoring data include concentrations that exceed CA DFG developed water quality criteria (Water Board, CASQA, LACSD)	USGS used Environment Canada action levels to evaluate the potential for adverse effects. These don't apply, as they are lower than the NOAEC for the most sensitive tested species (*Daphnia magna*).	The response does not mention the DFG water quality criteria, which were exceeded.
No analysis of urban uses (Water Board, CASQA)	Analysis is based on USGS urban watershed monitoring data.	
Urban surface water concentrations likely higher than U.S. EPA assumes (based on limited monitoring data) (Water Board, CASQA)	Please send us any monitoring data showing higher concentrations than listed in risk assessment.	Consistent with U.S. EPA position that someone else needs to monitor surface waters for pesticides.
Risk likely understated, as urban surface water concentrations likely higher than U.S. EPA assumes (Water Board, CASQA)	Data do not show risk exceedances for carbaryl [for fish], but they are likely to underestimate true exposure. Infrequent exceedances of risk thresholds for aquatic invertebrates expected.	Assessment of "risk exceedance" is based on OPP's comparison values (higher than the DFG water quality criteria). Consistent with OPP's routine dismissal of aquatic invertebrate risks, most of the documents say "no risk."
Consider risks from sewer discharges of pet care products (LACSD)	Pet care uses terminated, except impregnated collars	
Account for increased use due to diazinon phase out (Water Board, CASQA)	Use change is unknown and cannot be estimated.	

Carbaryl Revised Risk Assessment Comment Analysis
Comments from California Water Quality Agencies (Continued)

Comment	U.S. EPA Response	Notes
Risk Assessment (continued)		
Analysis of urban uses is feasible.	Modeling not currently feasible; must rely on monitoring data. "Having the capability to model urban uses would greatly strengthen" U.S. EPA urban pesticide use risk assessments. Modeling requires substantial monitoring data in the basin for calibration purposes and good pesticide usage data. Modeling needs to be for "high exposures" watersheds, which need to be identified. Urban runoff models are at a "developmental stage." OPP will "stay abreast of model developments."	Response implies that someone else needs to fill the identified data and modeling need before U.S. EPA will estimate upper-bound surface water concentrations of pesticides from urban uses. The U.S. EPA Office of Water (which has urban runoff models) does not appear to have been consulted.
Risk Management:		
Restrict carbaryl applications to situations where less toxic alternatives are unworkable (Water Board, CASQA)	No response	
Ensure Clean Water Act compliance (Water Board, CASQA)	No response	
Include water quality compliance costs and urban uses in economic analysis (Water Board, CASQA)	No response	
Promote safer alternatives (Water Board, CASQA)	No response	
Set schedule for follow-up work with OW and endangered species consultations (Water Board, CASQA)	No response	

Diazinon IRED Comment Analysis
Comments from California Water Quality Agencies

Comment	U.S. EPA Response	Notes
Concerned about long phase-out period (BASMAA, SF Environment)	Phase-out periods will allow growers ample time to seek effective alternatives.	Comment was about urban use; response was about agricultural use.
Restrict diazinon uses to situations where less toxic alternatives are not available and design restrictions to ensure water quality criteria are met. (Water Board, SF Environment)	Diazinon applications have been restricted to those where benefits are high. Use changes will significantly reduce diazinon releases to surface waters.	Benefits of some uses of water quality concern (e.g., nurseries, cut flowers) were not assessed, so U.S. EPA has no basis for claiming that "benefits are high" for these uses. Response avoids mentioning water quality criteria. Response avoids comparison among pest control methods.
Terminate nursery and cut flower uses. (BASMAA, SF Environment) Evaluate costs, benefits, and alternatives for nursery and cut flower uses and consider whether these uses are necessary. (Water Board)	There were no identified risks of concern from nursery and cut flower uses, so a formal benefits assessment was not deemed necessary. A low percentage of ornamentals are treated with diazinon.	Surface water quality risks from nursery and cut flower uses were not evaluated in the environmental risk assessment, making it impossible for U.S. EPA to know if there were "risks of concern" from these uses.
Include water quality agency costs and economic impacts from habitat impairment in economic analyses. (Water Board, BASMAA, SF Environment)	EPA historically has not assessed the economic impacts from risks to aquatic organisms because the agency does not have a reliable source of information as to what the costs of water quality management are. EPA's benefits assessments focus on pesticide users. No need for a benefits assessment, as there were no "drinking water" risks of concern.	Response confuses water quality risks (which are of concern) with drinking water supply risks.
Prohibit trunk wrap uses in urban areas. (Water Board, BASMAA, SF Environment)	U.S. EPA agreed to the request. Label language allows trunk wrap uses only in "agricultural settings."	

Diazinon IRED Comment Analysis
Comments from California Water Quality Agencies (Continued)

Comment	U.S. EPA Response	Notes
Include non-pesticidal alternatives and IPM in pesticide economic assessments (SF Environment)	IPM includes pesticide use. In many cases, non-chemical alternatives do not act quickly enough or do not "provide the degree of economic control required by many crops." U.S. EPA uses the "least costly alternatives" in predicting economic impacts.	
Complete Endangered Species Act consultation prior to RED and provide public comment period. (Water Board)	No response.	
Make follow-up technical studies public. (Water Board)	No response.	
Account for likely ecological effects of foreseeable market changes, avoid recommending harmful pesticide alternatives when less-toxic alternatives exist, and aggressively publicize less-toxic pest prevention and control methods. (Water Board, BASMAA, SF Environment)	U.S. EPA does not endorse specific alternatives, but rather informs stakeholders of which alternatives are available.	

MCPA RED Comment Analysis
Comments from California Water Quality Agencies

Comment	U.S. EPA Response	Notes
U.S. EPA should do a cumulative environmental risk assessment for phenoxy herbicides (Water Board)	At this time, however, OPP does not have a process for quantitatively assessing the cumulative ecological effects of pesticides; the best available science lacks the supporting data toxicity and exposure tools to conduct cumulative assessments for pesticides in the ambient environment.	
Water quality criteria are needed	No response.	

Note: No separate response to comments document was prepared; responses were incorporated into the RED.

Comment Analysis
Joint Counterpart Endangered Species Act Section 7 Consultation Regulations, Federal Register: August 5, 2004 (Volume 69, Number 150), Pages 47731-47762, 50 CFR Part 402

New Commitments: Changes in Risk Assessment Procedures

EPA has committed to modifying its ecological risk assessment procedures to address issues raised in the development of the endangered species act consultation rule. It is not clear how many of these changes will apply to all risk assessments (rather than just to species-specific ESA consultation risk assessments).

EPA will use all aquatic toxicity data available

- EPA has committed to conducting literature searches using ECOTOX as part of its ecological risk assessments for pesticides. As discussed in the Overview Document and the Letter of January 26, 2004, EPA's literature search will capture both studies in the publicly available component of ECOTOX and other studies that either have not yet been completely processed and entered into ECOTOX or were considered and rejected as inappropriate for inclusion in the public, web-based component.
- In situations where additional, scientifically valid toxicity data related to effects on wildlife and aquatic organisms are available, EPA will consider them in establishing the toxicity endpoint for risk assessment.

EPA will consider degradates and inerts/formulations

- EPA requires data from a series of laboratory and field studies of the environmental fate of both the active ingredients in a pesticide product and typical formulations containing the active ingredient. These studies provide data on both the parent active ingredient, as well as its environmental degradates. EPA combines these data, along with information about how the pesticide product is intended to be used, to develop an estimate of the potential concentrations of residues of the active ingredient and significant environmental degradates in the environment (the Estimated Environmental Concentration or EEC).
- Although limited, EPA also receives information from pesticide applicants and registrants about individual inert ingredients in pesticide formulations.
- Most of EPA's focus is on the potential risks from exposure to the active ingredient and its significant environmental degradates. EPA also reviews the available information on the other ingredients in pesticide products and on the formulations themselves, to assess the potential for increased risk.
- The Overview Document spells out how EPA will use the data it obtains on the toxicity of pesticide formulations.
- Absent information supporting a different conclusion, EPA assumes that any substance formed by the breakdown of a pesticide is as toxic as its parent compound.

EPA will use all scientific data

- EPA has committed to explaining in its risk assessments any decisions not to use a study obtained from the open literature or other source. Thus, if EPA obtains a study published in a scientific journal but decides not to make it part of the risk assessment

database, the decision will be fully documented, and both the Services and the public would be able to evaluate the adequacy of EPA's justification.

EPA will consider cumulative effects

- EPA has committed to review the open literature for information on whether a pesticide formulation or other chemical mixture will be active in an additive, synergistic or antagonistic manner. If EPA identifies data demonstrating interactive effects, it will use the data in its ecological risk assessments to the extent possible.
- The ECOTOX literature search also captures information on mixtures containing pesticide active ingredients. EPA has committed to review these data as part of its ecological risk assessments.

EPA will identify uncertainty

- EPA has committed to the identification of major sources of uncertainty in its risk assessments.

Comments / Responses

The responses below address all comments raised by the Water Board except comments about public involvement. Because the comments were rephrased by the agencies the responses do not exactly address the comments.

Comment: EPA's model does not estimate runoff from urban use, and its models do not account for nonagricultural use. Moreover, EPA lacks data on the extent of use of pesticides in urban areas and therefore cannot develop accurate estimates of environmental exposure from such use.

Response: No adequate models currently exist that are specific to estimation of pesticide runoff from urban use, nor that are specific to some nonagricultural uses. Moreover, there is rarely accurate and complete information on the amounts of pesticides used in urban areas. In the absence of such data and models, EPA considers surface water monitoring results in the risk assessment process for urban use pesticides. If such surface water modeling data, when linked to surrounding land use information, suggest that existing modeling efforts may underestimate surface water loads in urban landscapes, the issue would be discussed in the risk characterization section of a risk assessment. This discussion would be accompanied by an analysis of how such data affects the agency's confidence in risk assessment conclusions. The Services think that this approach is consistent with the use of the best scientific and commercial data available to EPA.

Comment: EPA's Office of Pesticide Programs (OPP) should work more closely with that agency's Office of Water.

Response: The Services are not in a position to direct the internal operations of EPA's offices.

Comment: EPA relies inappropriately on ``surrogate species'' in its risk assessment. EPA typically has insufficient information about risks because the agency usually lacks testing using important classes of animals--namely amphibians, reptiles, marine mammals, and freshwater mussels--and, despite this limitation, EPA does not include any uncertainty factor to account for the possible variation in sensitivity across species which can be three orders of magnitude.

Response: The Services carefully examined EPA's use of toxicity data from tests with surrogate species. EPA's Overview Document identifies the approximately two dozen different animal and plant species that an applicant or registrant (commonly a pesticide company) is required to study in the standard battery of eco-toxicity tests on a pesticide. The commenters are correct that such species do not include any amphibian, reptilian, or fresh water mussel species. As discussed above, EPA will review the open literature, and it is possible that studies from that source may contain information on the toxicity of a pesticide to additional species. EPA will use its best scientific judgment to choose the most appropriate surrogate for a listed species from all of the available data. Even with this extensive database, however, risk assessments necessarily must be based on testing with a finite number of species. When a species has not been tested, the data on surrogate species constitutes the best available scientific and commercial information to analyze the toxicological sensitivity of untested species. Further, EPA has agreed to discuss in its risk assessments the uncertainties associated with use of surrogate species. EPA also committed to work with the Services to develop methods to increase the level of confidence in future assessments.

Finally, although not employed expressly to address uncertainties in relying on surrogate species, the Services note that throughout its risk assessment methodology EPA deliberately uses conservative assumptions that add in a measure of additional protections.

Comment: Cumulative stressors and impacts to endangered and threatened species will no longer be fully addressed.

Response: The ecological risk assessment process as described in the Overview Document commits EPA to consider the environmental baseline when appropriate. As part of the environmental baseline, cumulative stressors and impacts to listed species will be considered.

Comment: EPA does not evaluate the potential effects of exposure either to inert ingredients in pesticide formulations or to substances formed by the environmental degradation of pesticides.

Response: The comments are incorrect. EPA's Overview Document describes the extensive information required to characterize the environmental fate of a pesticide, including the identification of any toxicologically significant degradation products/metabolites. In addition, absent information supporting a different conclusion, EPA assumes that any substance formed by the breakdown of a pesticide is as toxic as its parent compound. Although limited, EPA also receives information from pesticide applicants and registrants about individual inert ingredients in pesticide formulations. The ECOTOX literature search also captures information on mixtures containing pesticide active ingredients. EPA has committed to review these data as part of its ecological risk assessments. Finally, the Overview Document spells out how EPA will use the data it obtains on the toxicity of pesticide formulations.

The Services recognize that more extensive information is typically available about pesticide active ingredients than inert ingredients, and therefore EPA has a more limited ability to assess the risks posed by these compounds to listed species. In light of these limitations, the Services have concluded that EPA's approach makes

appropriate use of the best scientific and commercial information available to evaluate these types of substances.

Comment: Active ingredients are typically formulated with other, sometimes more toxic ``inert'' substances to make pesticide products and such products are then often mixed with adjuvants. EPA's risk assessment process fails to consider the effects of pesticide mixtures on endangered and threatened species. EPA does not assess the potential additive or synergistic effects of exposure to the combination of these substances. Such combinations are important because water monitoring data demonstrate the presence of multiple chemicals in many water samples and that many of the substances appearing in combination share a common mechanism of toxicity.

Response: While there often is very little or no information, EPA has committed to review the open literature for information on whether a pesticide formulation or other chemical mixture will be active in an additive, synergistic or antagonistic manner. If EPA identifies data demonstrating interactive effects, it will use the data in its ecological risk assessments to the extent possible. The Services believe this approach is scientifically appropriate and consistent with the ESA. The Services recognize, however, that this approach still leaves some scientific uncertainty about whether pesticides and other chemicals will interact to produce more serious effects than expected from exposure to individual compounds. There is no scientific consensus on how to address this source of uncertainty. Therefore the Services also think it is appropriate that EPA has committed to the identification of major sources of uncertainty in its risk assessments.

Comment: EPA does not appropriately consider cumulative effects as required under the ESA. Under the Federal Food, Drug, and Cosmetic Act (FFDCA), EPA is required to assess cumulative effects for food use pesticides and other substances sharing a common mechanism of toxicity.

Response: EPA's Overview Document contains a commitment to conduct a review of cumulative effects, as defined under the ESA, on those FIFRA actions for which EPA cannot conclude that the action is not likely to adversely affect listed species or critical habitat. Since the nature of any cumulative assessment will depend on the scope of the action being considered, the Services think that EPA has appropriately expressed an intention to evaluate such effects on a case-by-case basis. The Services and EPA intend to work together to ensure that an adequate evaluation of the cumulative effects is performed for an action.

The Services note that the meaning of the term, ``cumulative effects,'' under the ESA is very different from the way that term is used under the FFDCA. Under ESA, cumulative effects refers to the effects on listed species and critical habitat of future State and private activities reasonably certain to occur within the action area of the federal action subject to consultation. Under the FFDCA, EPA must consider the cumulative effects on humans that may result from exposure to the pesticide chemical and other substances sharing a common mechanism of toxicity. Thus, the two meanings are quite distinct, and the FFDCA use of the term should not be applied to assessments under the ESA.

Comment: EPA may underestimate exposure to the extent that pesticides are applied in ways or amounts other than as allowed on the label.

Response: While the Services recognize that misuse may occur, we believe it is reasonable to assume pesticides are used lawfully unless data demonstrate a

widespread and commonly recognized pattern of misuse. In fact, as the Overview Document states, many pesticides are typically applied at lesser rates and frequency than permitted by the label.

Comment: EPA has never implemented the approach to ecological risk assessment described in its Overview Document.

Response: Although past risk assessments have not contained every element described in the Overview, the Overview Document reflects the approach to ecological risk assessment that EPA intends to use in the future. In fact, the Overview contains a number of new elements that will strengthen the agency's future evaluations of pesticide impacts on listed species. EPA, however, has routinely been using many of the methodologies described in the Overview Document for a number of years. While some of the methodologies are relatively recent, EPA has experience with all elements of the methodologies described and has begun developing effects determinations using these new methodologies. Further, the rule provides a number of mechanisms the Services can use to ensure that EPA's program for making effects determinations under new subpart D is consistent with the requirements of the ESA.

Comment: Many of EPA's past assessments of ecological risks to listed species and critical habitat were not adequate under the ESA. Commenters cited several specific examples. The Services, in many past reviews of EPA's approach to ecological risk assessment, have disparaged EPA's methodologies and have concluded that they deal inadequately with a range of effects: sublethal effects of pesticide ingredients, indirect effects (alteration of the aquatic community structure), effects of inert ingredients and adjuvants, and additive and synergistic effects resulting from interactions among different chemical substances.

Response: EPA has committed to make effects determinations using the approach to ecological risk assessments reflected in the Overview Document: this approach differs from the approaches EPA has used in the past. The Services believe EPA's approach to ecological risk assessment in the future, as set forth in the Overview Document, addresses the specific concerns in the comment. The Services believe that past determinations are not a relevant measure of EPA's ability to produce adequate effects determinations, and are confident that future effects determinations using the methodologies identified in the Overview Document will fully comport with the ESA. Comments and responses above address the specific concerns identified in these comments.

Comment: The proposed counterpart regulations change the longstanding definition of ``best scientific and commercial data available'' and ``cumulative impacts'' in a way that is bad for species.

Response: The Services note that ``best scientific and commercial data available'' is not defined in the ESA or part 402 of the regulations and do not intend to change the way that phrase has been applied in the past. The Services also note that the term ``cumulative impacts'' is not used in the ESA or in the counterpart regulations. The Services use the term ``cumulative effects'' as defined in Sec. 402.02 and specifically reaffirm that definition.